

AUTOMOTIVE CLAMP ACCESSORY

CROSS REFERENCES TO RELATED APPLICATIONS: U.S. Provisional Application for Patent 60/532,744, filed 12/29/2003, with title "Adjustable Automotive Clamp Accessory that Allows a Forward or Angled Pull on a Post or Panel that has a Lip on the Rear of the Post or Panel" which is hereby incorporated by reference. Applicant claims priority pursuant to 35 U.S.C. Par. 119(e)(i).

Statement as to rights to inventions made under Federally sponsored research and development: Not Applicable

BACKGROUND OF THE INVENTION

1. Field of the Invention.

The present invention relates generally to vehicle collision repair, in particular to the straightening of a damaged post or panel of the vehicle's body or frame. Specifically, the present invention is directed to a clamp accessory that can be used with existing prior art clamps to pull on a damaged vehicle's post or panel that has an edge, or lip disposed on the rear of the post or panel. Once the prior art clamp, and clamp accessory of the present invention is attached, straightening is accomplished by pulling on the clamp accessory with an external force to return the post or panel back to its original shape.

2. Brief Description of Prior Art.

Automotive accidents produce damage of varying severity to the involved vehicles. In a relatively minor automobile accident of the "fenderbender" type, only the bodywork of the automobile is damaged. The automobile can then be

generally repaired by replacing the damaged bodywork panel. In more severe accidents, all or part of the frame of the automobile can be bent, in addition to the bodywork panels.

The prior art method to repair a damaged vehicle's bent frame is to generally grab hold of the damaged portion with a prior art pull clamp or sling, attach an external frame straightening puller to the frame, and apply a sufficiently large pulling force by the external puller to the pull clamp or sling and thence to the frame, so that the frame is straightened back to its original form.

A problem with the prior art method discussed above is that it is often required to remove bolted-on vehicle parts such as headlights, fenders, etc., or attached glass such as windshields, windows etc., in order for the pull clamp or sling to properly access or grab the frame. Removing vehicle parts in order to ultimately access the damaged frame of the vehicle results in increased labor cost, as well as additional risk of windshield or window breakage and bodywork damage.

The present invention concerns an automotive clamp accessory that allows a prior art pull clamp to grip the rear edge or lip of a damaged post or panel without first being required to remove bolted-on vehicle parts or attached glass in order for the pull clamp to properly access or grab the frame. As will be seen from the subsequent description, the preferred embodiments of the present invention overcome the above problems and difficulties of the prior art.

SUMMARY OF THE INVENTION

The present invention is directed to an automotive clamp accessory that can be used with existing prior art clamps to pull on the rear edge or lip of the post of

panel of a damaged vehicle's frame. Once a prior art pull clamp, and automotive clamp accessory of the present invention is attached, straightening is accomplished by pulling on the automotive clamp accessory with an external force to return the post or panel back to its original shape. The automotive clamp accessory allows a prior art pull clamp to grip the rear edge or lip of a damaged post or panel without first being required to remove bolted-on vehicle parts or attached glass in order for the pull clamp to properly access or grab the frame. The automotive clamp accessory includes a base member formed of a first end portion, a second end portion, and a wall disposed between the first and second ends. The second end portion includes a body bore for attaching the clamp accessory to a chain and external force applying device. The first end portion having a pair of opposing pivot bores for mounting the prior art pull clamp thereto. The clamp accessory further includes side walls that extend the length of the base member.

In application, prior art pulling clamp is positioned to grip onto the damaged portion of the vehicle frame. The clamp accessory is slid over the sliding bars of the pull clamp and tightened with nuts. The pulling clamp may be tightened in selected positions for various straightening applications. In position, the clamp accessory passes over the damaged frame so that the body bore of the clamp accessory is aligned and on an axis with the clamp jaws of the pull clamp. A pulling chain is attached to the body bore to exert the forward pulling force on the axis.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a top perspective view of a preferred embodiment of the present invention, an automotive clamp accessory.

Fig. 2 is a side view of the automotive clamp accessory of Fig. 1.

Fig. 3 is an exploded view of the automotive clamp accessory of Fig. 1 and further illustrates a prior art pull clamp.

Figs. 4 and 5 is a side perspective view of the automotive clamp accessory of Fig. 1 mounted to the prior art pull clamp.

Fig. 6 is a perspective view of the attachment of the automotive clamp accessory mounted to the prior art pull clamp as shown in Figs. 4 and 5 to an automobile fender.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In accordance with the present invention, an automobile clamp accessory used when straightening a damaged vehicle's body or frame is disclosed. The automotive clamp accessory is directed to an automotive clamp accessory that can be used with existing prior art clamps to pull on the rear edge or lip of the post of panel of a damaged vehicle's frame. Once the prior art clamp is attached to the damaged portion of the vehicle frame and to the clamp accessory of the present invention, straightening is accomplished by pulling on the automotive clamp accessory with an external force to return the post or panel back to its original shape.

Specifically, it will be noted in the drawings that the automotive clamp accessory relates to an apparatus that allows a prior art pull clamp to grip the rear edge or lip of a damaged post or panel without first being required to

remove bolted-on vehicle parts or attached glass in order for the pull clamp to properly access or grab the frame. In the broadest context, the automotive clamp accessory of the present invention consists of components configured and correlated with respect to each other so as to attain the desired objective.

Figs. 1- 6 illustrate a preferred embodiment of an automotive clamp accessory 1 made in accordance of the present invention. Figs. 1 and 2 depict top perspective and side views of the clamp accessory 1. Fig. 3 shows an exploded view of a prior art pull clamp 100 and the clamp accessory 1. Figs. 4 and 5 depict top perspective views of the clamp 100 mounted to the clamp accessory 1, differing only to the extent that Fig. 4 illustrates the clamp 100 rotated in relation to the clamp accessory 1 in a first position, and Fig. 5 illustrates the clamp 100 rotated in relation to the clamp accessory 1 in a second position. Fig. 6 illustrates the clamp accessory 1 mode of attachment to an automobile frame 200.

Referring to Fig. 1, the automotive clamp accessory 1 may be described as having a base member 3 formed of a first end portion 5 and a second end portion 7. As will be further described, the first end portion 5 representing the rotatable clamping portion for mounting to the prior art pull clamp 100. The base member 3 of the clamp accessory 1 further includes a slanted wall 9 integral to, and disposed between the first and second ends 5, 7, so that the first end portion 5 is elevated in relation to the second end portion 7, thence forming a "stair-step" configuration, as best shown in Fig. 2. In the preferred embodiment, the slanted wall 9 constructed having an angle designated as letter "A" in Fig. 2, preferably a 45 degree angle.

The second end portion 7 of the base member 3 including a body bore 10 for attaching the clamp accessory 1 to a chain 110 (shown in Fig. 6) and external force applying device (not shown). The first end portion 5 including a pair of opposing pivot bores 11 for mounting the prior art pull clamp 100 to the first end 5 of the clamp accessory 1, as best shown in Figs. 3 - 5. As shown in Fig. 1, the pivot bores 11 each having generally a "kidney shaped" configuration. This configuration is important for proper rotation of the pull clamp 100 when mounted to the clamp accessory 1 as shown in Figs. 4 and 5.

The clamp accessory 1 further includes side walls 12 that extend the length of the base member 3. The base member 3 and side walls 12 can be manufactured as separate pieces and then assembled together in the form shown in the drawings or in the alternative, can be manufactured as a single piece.

Fig. 3 best illustrates the components of the prior art pull clamp 100. The clamp 100 generally includes upper and lower jaws 103A and 103B, and sliding bars 50 having threaded ends that slide through apertures 103C in the jaws 103A and 103B. Washers 30 and nuts 40 assemble and tighten the pull clamp 100 in position in the form shown in Figs. 4 - 6.

The clamp 100 is mounted to the first end portion 5 of the clamp accessory 1 as shown in Fig. 3. In particular, the sliding bars 50 slide through the apertures 103C of the jaws 103A, 103B as described above, and preferably through apertures 71 of a spacer plate 70, through the pivot bores 11 in the first end portion 5, and through apertures 21 of a reinforcement plate 20. The washers 30 and nuts 40 assemble and tighten the clamp accessory 1 to the pull clamp 100. As will be further described, the clamp 100 may be tightened in selected positions (see

Figs. 4 and 5 for example) for various straightening applications, by sliding the sliding bars 50 within the pivot bores 11 until the clamp 100 is properly positioned to grab hold of the damaged portion with the jaws 103A, 103B of the clamp 100.

As best shown in Figs. 1, 3 and 4, the clamp accessory 1 further includes a center hole 15 disposed at an equal distance between the pivot bores 11. The clamp 100 may be selectively positioned at an approximate 45 degree angle, in either direction, with respect to the center hole 15.

In the preferred embodiment the clamp accessory 1 includes the spacer plate 70 disposed between the clamp 100 and the clamp accessory 1 as described above however, the spacer plate 70 is optional to the operation of the present invention. The reinforcement plate 20 positioned on the upper surface of the first end portion 5 of the clamp accessory 1 provides reinforcement or added strength to the base 3 of the clamp accessory 1 during application.

The present invention allows a forward pull on the vehicle's damaged frame without first removing obstructing vehicle parts. To use the clamp accessory 1 in frame straightening, the jaws 103A, 103B of the prior art clamp 100 is positioned to grip onto the rear edge of the vehicle frame's post or panel. The clamp accessory 1 is then slid over the sliding bars 50 of the pull clamp 100 and tightened with nuts 40, thereby fixing the pull clamp 100 to the frame and to the clamp accessory 1. In application, the clamp accessory 1 passes over the damaged post or panel, and the stair-step configuration of the clamp accessory 1 as described fits over the damaged portion of the frame at an inward direction. As shown in Figs. 4 - 6, in position, the body bore 10 is aligned and on an axis with the jaws 103A, 103B of the pull clamp 100. The pulling chain

110 is attached to the body bore 10 to exert the forward pulling force on the axis.

Although the description above contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention. As such, it is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the claims.

It will be obvious to those skilled in the art that modifications may be made to the embodiments described above without departing from the scope of the invention. Thus the scope of the invention should be determined by the claims in the formal application and their legal equivalents, rather than by the examples given.